

19. Discuss the theory, instrumentation and applications of Atomic Absorption spectroscopy.
20. (a) Describe the different types of titration curves in amperometric titration.
- (b) Write a note on Laser Raman spectroscopy.

NOVEMBER/DECEMBER 2023

DECH43A — INORGANIC CHEMISTRY — IV

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.



1. How will IR spectroscopy differentiate between CN^- and NC^- bonded metal complexes?
2. What is the requirement for a molecule to be Raman active?
3. What is electric field gradient in NQR spectroscopy?
4. Account for the following: Mossbauer effect cannot be observed in liquids and gases.
5. Write and explain Zeeman equation.
6. Define isotropic and anisotropic 'g' value.
7. Why the technique of AAS is only limited to metals?
8. What is ICP-AAS? What are its advantages?

9. List the reasons for using dropping mercury electrode in polarography.
10. What is the principle underlying in amperometric titration?

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Explain the usefulness of UV – vis spectra in the structural elucidation of organometallic compounds.

Or

- (b) Distinguish the following linkage isomers by IR spectroscopy M-SCN and M-NCS; M-NO and M-ON.

12. (a) How NMR is useful in the structural determination of 31_p and 19_f compounds.

Or

- (b) Discuss the applications of MB spectroscopy of Iron compounds.

13. (a) What is the reason for anisotropy in 'g' value? Explain.

Or

- (b) Explain the Kramer's degeneracy with an example.

14. (a) Discuss the spectral and chemical interferences of atomic absorption spectroscopy.

Or

- (b) Discuss the principle and instrumentation of HPLC with neat diagram.

15. (a) Describe the determination of magnetic susceptibility by Guoy method.

Or

- (b) Explain the basic principle of polarography.



SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Illustrate the application of IR spectroscopy in the structural elucidation of coordination complexes.

17. (a) Write a note on NMR shift reagents.

- (b) Discuss the NQR spectra of nitrosyl compounds.

18. (a) State Koopman's theorem. Discuss the conditions under which the theorem breaks down.

- (b) Illustrate ESR hyper fine splitting with suitable examples.